UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,409	11/10/2003	William M. Hiatt	2269-5558D US (99-0253.03	3302

24247 7590 10/17/2006

TRASK BRITT
P.O. BOX 2550
SALT LAKE CITY, UT 84110

EXAMINER	
KOSOWSKI, ALEXANDER J	
ART UNIT	**PAPER NUMBER**
2125	

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/705,409	HIATT ET AL.	
	Examiner	Art Unit	
	Alexander J. Kosowski	2125	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 August 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-63* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,20-31,33-37,40,42-45,57,58,61 and 63* is/are rejected.

7)☒ Claim(s) *12-19,32,38,39,41,46-56,59,60 and 62* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/3/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1) Claims 1-63 are presented for examination in light of the response filed 8/4/06. In addition, the IDS filed 12/03/04 has now been considered.

Allowable Subject Matter

2) Claims 12-19, 32, 38-39, 41, 46-56, 59-60 and 62 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

3) The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4) Claims 1-2, 35-37, and 57-58 are rejected under 35 U.S.C. 102(b) as being unpatentable by Sanders, Jr. et al (U.S. Pat 5,506,607).

Referring to claim 1, Sanders teaches a programmable material consolidation apparatus (Abstract), comprising: a retention system including a support surface for supporting at least one substrate on or adjacent to which one or more objects are to be formed and configured to prevent lateral movement of the at least one substrate (col. 13 line 32 through col. 14 line 11, whereby a mounting plate is prepared and attached to a platform, and a model is formed on the surface, and whereby the plate is firmly attached and would therefore be incapable of lateral movement).

Referring to claim 2, Sanders teaches a selective material consolidation system configured to form one or more objects (col. 12 line 55 through col. 13 line 27).

Referring to claim 35, Sanders teaches an ejection element (col. 14 lines 15-46).

Referring to claim 36, Sanders teaches the ejection element is configured to facilitate removal of the at least one substrate from the retention component (col. 14 lines 15-46).

Referring to claim 37, Sanders teaches that an ejection element is configured to break a seal between the substrate and the support surface (col. 14 lines 15-46).

Referring to claim 57, Sanders teaches a programmable material consolidation apparatus (Abstract), comprising a support surface configured to receive at least one substrate on which programmed consolidation of unconsolidated material is to be effected and a selective material consolidation system directed toward the support surface for effecting the programmed consolidation to form at least one object on or adjacent to the at least one substrate (col. 12 line 55 through col. 14 line 11, whereby a mounting plate is prepared and attached to a platform, and a model is formed on the surface), and an ejection element associated with the support surface for facilitating removal of the at least one substrate from the support surface following the programmed consolidation (col. 14 lines 15-46).

Referring to claim 58, Sanders teaches that an ejection element is configured to break a seal between the substrate and the support surface (col. 14 lines 15-46).

Claim Rejections - 35 USC § 103

5) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6) Claims 3-9 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanders, further in view of Tischler (U.S. PGPUB 2003/0114016).

Referring to claims 3-9, Sanders teaches the above. However, Sanders does not explicitly teach at least one raised element around a portion or entire extent of a periphery of the support surface configured to prevent lateral movement and comprising at least one access element to facilitate removal a substrate from a receptacle formed by the support surface and raised element, wherein the access element comprises a recess in an interior portion of the raised element and wherein the raised element is secured to the support surface adjacent to the periphery.

Tischler teaches a substrate support apparatus for wafer processing including deposition (Abstract) wherein the retention system includes at least one raised element around at least a portion of a periphery of the support surface (Paragraph 0077 and Figure 4), wherein the at least one raised element is configured to prevent lateral movement of the at least one substrate (Paragraph 0077 and Figure 4), wherein the at least one raised element extends around an entire extent of the periphery of the support surface (Paragraph 0077), wherein the retention system comprises at least one access element (Paragraphs 0060-0061), wherein the at least one access element facilitates removal of the at least one substrate from a receptacle formed by the support surface and the at least one raised element of the retention system (Paragraphs 0060-0061 and Figure 4), wherein the at least one access element comprises at least one recess in at least an interior portion of the at least one raised element (Paragraph 0064) and wherein the at least one raised element is secured to the support surface adjacent to the periphery thereof (Figure 4).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize the features of the substrate support apparatus taught by Tischler in the

programmable material consolidation apparatus taught by Sanders since a dimensionally close fit substrate carrier would permit a wafer carrier to hold a substrate in place through all processes (Tischler, Paragraph 0051), and since this would allow a substrate to fit snugly and frictionally with the recess of a wafer carrier (Tischler, Paragraph 0065).

Referring to claim 43, Sanders teaches the above. However, Sanders does not explicitly teach that the retention element includes a locking ring including a side wall configured to surround at least a portion of a periphery of the at least one substrate upon positioning of the at least one substrate on the support surface.

Tischler teaches a substrate support apparatus for wafer processing whereby a locking ring is includes a side wall configured to surround a portion of a substrate (Figure 4).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize the locking ring taught by Tischler in the apparatus taught by Sanders since this would help to allow a substrate to fit snugly and frictionally with the recess of a wafer carrier (Tischler, Paragraph 0065).

7) Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanders, further in view of Tischler, further in view of Jensen, Jr. et al (U.S. PGPUB 2001/0032111).

Referring to claims 10-11, Sanders and Tischler teach the above. However, they do not explicitly teach that the at least one raised element comprises cured photopolymer, nor that the raised element comprises a plurality of at least partially superimposed, contiguous, mutually adhered layers.

Jensen teaches a programmable material consolidation apparatus which builds a carrier including a raised element out of cured photopolymer comprising mutually adhered layers (Paragraphs 0039 and 0042).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to create a raised element out of cured photopolymer in the invention taught above since this would allow a carrier to be custom fabricated with a perimeter to restrict lateral movement of a substrate (Jensen, Paragraph 0042).

8) Claims 20-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanders, further in view of Cheng (U.S. Pat 5,304,248).

Referring to claims 20-21, Sanders teaches the above. However, Sanders does not explicitly teach that the retention system comprises at least one alignment feature, nor that the at least one alignment feature engages or abuts a corresponding feature of the at least one substrate.

Cheng teaches a programmable substrate deposition system which utilizes a retention system comprising an alignment feature which abuts a feature of the substrate (col. 6 lines 37-56 and Figure 4).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize an alignment feature in the retention system of the invention taught above since this would allow a shield ring to be moved back into rotational alignment with support means if it is misaligned, therefore allowing the flat portion to maintain the same orientation (Cheng, col. 6 lines 50-56).

Referring to claims 22-26, Sanders teaches the above. However, Sanders does not explicitly teach that the retention system includes at least one sealing element at the support surface thereof, that the sealing element is positioned to underlie at least a periphery of the at least one substrate, that the sealing element comprises an annular member, that the sealing element is configured to prevent unconsolidated material from contacting a lower surface of the at least one substrate when the at least one substrate is positioned over the support surface, nor that the sealing element comprises a compressible, resilient member.

Cheng teaches a programmable substrate deposition system which comprises a retention element including a sealing element in an annular shape that underlies a periphery of the substrate and may be made of a compressible member to prevent dispensed material from contacting the underside of the substrate (col. 5 lines 3-55 and Figure 5).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize a sealing element to prevent material from contacting the backside of the substrate in the invention taught above since this would provide a simplified seal ring which would engage a semiconductor wafer to protect the edges and backside of the wafer from undesirable depositions on such surfaces of the wafer (Cheng, col. 2 lines 10-14).

9) Claims 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanders, further in view of Tischler, further in view of Cheng.

Referring to claims 44-45, Sanders and Tischler teach the above. However, they do not explicitly teach that the locking ring includes a lip which extends laterally and inwardly from an

upper end of the side wall thereof, nor that the lip is configured to cover at least a peripheral portion of a surface of the at least one substrate.

Cheng teaches a locking ring including a lip which covers a portion of a substrate (Figure 2).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize a locking ring including a lip which covers a substrate in the invention taught above since this lip would be sufficient to provide a seal between the backside of a wafer and a process gas (Cheng, col. 5 lines 29-55).

10) Claims 27-31 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanders, further in view of Cheng, further in view of Jensen.

Referring to claims 27-31 and 34, Sanders and Cheng teach the above. However, they do not explicitly teach that the retention system further includes at least one pressure port formed in the support surface and located within an interior defined by the at least one sealing element, a pressure source in communication with the at least one pressure port, that the one pressure source comprises a negative pressure source, an ejection element which also includes the at least one pressure port, that the pressure source comprises a positive pressure source, nor at least one control element for controlling at least one of operation of the at least one pressure source and communication between the at least one pressure source and the at least one pressure port of the retention element.

Jensen teaches the use of a pressure port in the support surface which utilizes positive and negative pressures to hold the substrate and eject the substrate (Paragraph 0042, whereby a

pressure source would be necessary to feed a pressure port and whereby air pressure within a confined space would create an air flow and whereby a control element would inherently be utilized).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize a pressure port comprising positive and negative pressure in the invention above since uniformly distributed vacuum pressure would allow a wafer to be held in a carrier and since changing the pressure exerted on the wafer would assist in removal of the wafer from the carrier (Jensen, Paragraph 0042).

11) Claims 40 and 42 and 61 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanders, further in view of Jensen.

Referring to claims 40 and 42, see rejection of claims 27-31 and 34 above.

Referring to claims 61 and 63, see rejection of claims 27-31 and 34 above.

12) Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sanders, further in view of Cheng, further in view of Jensen, further in view of Tischler.

Referring to claim 33, Sanders, Cheng and Jensen teach the above. However, they do not explicitly teach that an ejection element is configured to facilitate grasping of the at least one substrate positioned over the support surface.

Tischler teaches an ejection element to facilitate grasping a substrate (Paragraph 0060).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize an ejection element for grasping in the invention taught above since this

would allow selective exertion of suction to effect pickup, retention and transfer of a wafer (Tischler, Paragraph 0060).

Response to Arguments

13) Referring to claim 1, applicant argues that "neither the surface of the base plate nor the surface of the sheet of material is 'configured to prevent lateral movement of...at least one substrate'". Applicant justifies this by saying that "both the resistant base plate and the sheet of material have flat surfaces". In response, examiner notes col. 13 lines 40-67 of Sanders, which states that card stock is saturated with MC compound and, when cooled, "will be securely attached to the plate". Therefore, the card stock ("substrate") which is "securely attached" to a base plate is incapable of "lateral movement", as per claim 1.

Referring to claims 35 and 57, applicant argues that "Sanders does not...describe an 'ejection element'". Applicant justifies this by saying that "Sanders is limited to use of heat or a solvent to facilitate removal of the sheet of material from the heat resistant base plate". In response, examiner notes that col. 14 lines 15-46 of Sanders teach that a "shearing force" is applied to the card stock, thereby causing the card stock to "suddenly release and slide off the plate". Examiner interprets this application of a shearing force as an "ejection element", as per claims 35 and 57.

Referring to claim 43, applicant argues that "Sanders and Tischler...does not expressly...describe a retention system that includes a locking ring" and request examiner to show which element of Figure 4 discloses a locking ring. In response, examiner notes that element number 139 of Figure 4 forms the claimed "locking ring" of claim 43. Element number

139 comprises a retention lip which completely surrounds a substrate in a ring, and examiner interprets this as a type of "locking ring".

Referring to claims 3-9 and 43, applicant argues that hindsight has been utilized to combine Sanders and Tischler. In response, examiner notes that it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this case, both Tischler and Sanders deal with process tools for effecting processing of some type on a substrate, and a motivation to combine is recited in the rejection given above.

Referring to claims 10-11, applicant argues that hindsight has been utilized to combine Sanders and Tischler and Jensen. In response, examiner notes that it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this case, Tischler and Sanders and Jensen all deal with process tools for effecting processing of some type on a substrate, and a motivation to combine is recited in the rejection given above.

Referring to claims 12, 13 and 17, arguments are moot in view of the indication of allowable subject matter above.

Referring to arguments regarding claims 38-39 and 59-60, the arguments are moot in view of the indication of allowable subject matter noted above. However, with regard to the hindsight arguments addressed towards claims 20-26, examiner notes that it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Referring to arguments regarding claims 44-45 that "Tischler does not provide any motivation...to combine", examiner notes that a proper motivation to combine is given in the maintained rejection above.

Referring to arguments regarding claim 32, the arguments are moot in view of the indication of allowable subject matter above. Referring to arguments regarding claims 27-31 and 34 and the combination of Sanders, Cheng, and Jensen, examiner notes that the combination is proper and a proper motivation has been provided for the combination in the rejection above.

Referring to arguments regarding claims 41 and 62, the arguments are moot in view of the indication of allowable subject matter above

Referring to arguments regarding to claim 33, applicant argues that the teachings of Tischler "are limited to use of a conventional vacuum pick-up head to remove a wafer from the carrier..." and that there is no suggestion of "an ejection element that is configured to facilitate grasping". In response, examiner notes that one definition of the word "grasp" is "to hold

firmly". Therefore, examiner interprets a vacuum pick-up head capable of removing a wafer as an "ejection element...to facilitate grasping of at least one substrate...".

Referring to arguments regarding claims 50, 51 and 54-56, the arguments are moot in view of the indication of allowable subject matter above.

Conclusion

14) **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

15) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander J Kosowski whose telephone number is 571-272-3744. The examiner can normally be reached on Monday through Friday, alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on 571-272-3749. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300. In addition, the examiner's RightFAX number is 571-273-3744.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2100.

Alexander J. Kosowski
Patent Examiner
Art Unit 2125

Albert W. Paladini 10-13-06
ALBERT W. PALADINI
PRIMARY EXAMINER